SCIENCE & EDUCATION Impact

Benefits from USDA/Land-Grant Partnership

Environmentally Friendly Farming

Ecosystems benefit from refined farming practices.

With help from Land-Grant universities and U.S. Department of Agriculture (USDA) scientists, farmers are modifying their practices to create greater harmony with the environment. As competition for water increases, these scientists are finding new ways to prevent water pollution and to conserve and reuse this scarce resource.

Payoff

- **Wetlands wash wastewater.** An eight-year study by **Auburn** scientists shows constructed wetlands eliminate odors and remove most of the pollutants from wastewater that can adversely affect the environment. Constructed wetlands have successfully treated all wastewater generated by a 500-pig operation in **Alabama.** The treated wastewater meets federally mandated discharge criteria. This method has been used as a prototype by many communities and farming operations.

- **A better picker-upper.** A **Louisiana State** researcher developed a biodegradable product that can clean up spilled oil in hard-to-reach places. Milled bagasse — the fibrous leftovers from sugar production — soaks up the mess, and treating it with ammonia creates an inviting environment for the bacteria that digest the oil. Ammoniated bagasse cleans up 98 percent of spilled oil within 90 days.

- **Compost cleans up contaminated soil.** Fuels and numerous organic chemicals degrade rapidly during the composting process. **Illinois** scientists found that adding compost to the soil accelerates the natural degradation of contaminants while improving plant establishment and reducing the potential for soil erosion. This low-cost remediation system makes it possible to clean up contaminated sites that would be left untreated due to the expense of cleanup.

- **Stretching the water.** Research revealed that **Arkansas** farmers could drain rice fields 11 days sooner than normal without reducing grain yield or milling quality. Arkansas scientists estimate the earlier irrigation termination will save farmers $750,000 to $1.2 million. Farmers have further enhanced savings by using the extra

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water for soybean production. Land preparation costs are also reduced because the soil has more time to dry before harvest, which means combines cause fewer ruts in soil.

- **Slowing the sediment journey.** Soil erosion reduces productivity, and the resulting sediments pollute streams and lakes. USDA and **Georgia** researchers and extension agents teamed up to develop an environmentally friendly cotton cropping system. Conservation tillage has increased from 88,400 acres in 1994 to more than 200,000 acres in 1998. On these acres, less soil and sediments reach streams, and there is more soil organic matter on the soil surface. **Tennessee** growers using residue management systems have reduced soil erosion by 20 million tons annually and sediment in streams and lakes by 10 million tons annually. **Tennessee** researchers estimate this reduction in sediment is worth $40 million to $50 million annually.

- **Posh pads.** Coal-burning power plants in **Ohio** annually produce 4 million to 6 million tons of a lime-enriched material called flue gas desulfurization or FGD. This byproduct must be stored or disposed of in landfills. **Ohio State** researchers have shown that livestock farmers can use the FGD to construct livestock and hay storage pads. The cost to install the FGD pads was 25 percent to 65 percent cheaper than if stone aggregate or concrete had been used.

- **No burning desire.** After the Oregon Legislature mandated a phase-down of field-burning, **Oregon State** Extension showed grass seed growers alternatives to burning. Since 1988, Willamette Valley grass seed growers reduced the number of acres burned by more than 70 percent. At the same time, grass seed plantings rose from 332,600 acres in 1988 to 410,500 acres in 1997. By baling the seed crop residue, growers have created a grass straw export market worth about $15 million.

- **Movable feast.** Researchers at **North Dakota State** have been demonstrating how short-term, intense rotational grazing can improve areas around wetlands and enhance cattle profitability. Ranchers are raising more cattle on less land by quickly rotating their herds through small parcels of grasslands. The practice also appears to encourage regrowth of favorable plant species to improve the quality of wetlands for wildlife habitat.

- **Cutting down on chemicals.** Atrazine, a herbicide commonly used in corn and sugarcane, appeared in a **Louisiana** water system at unsafe levels. **Louisiana State** researchers and extension specialists monitored the situation and promoted alternative weed control methods. Sugarcane farmers reduced atrazine use by 57 percent. **Ohio State** researchers have developed turfgrass management practices — some as simple as mowing at the proper height— that enable homeowners to reduce lawn chemical use by more than 50 percent.

- **Better wood chips.** The lumber industry is working with smaller wood elements and unfamiliar tree species to meet construction industry demand. **West Virginia** researchers built a characteristics database of Appalachian hardwoods that will be used to predict mechanical properties and performance in composite wood products. The information will save expensive manufacturing trials and testing.

Cooperative State Research, Education, and Extension Service
United States Department of Agriculture

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